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# NASA Procedural Requirements

**COMPLIANCE IS MANDATORY****NPR 2570.1B**Effective Date: December  
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## **Subject: NASA Radio Frequency (RF) Spectrum Management Manual**

**Responsible Office: Space Operations Mission Directorate**

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## **Chapter 1: General**

### **1.1 Purpose**

This NPR provides guidance in the identification and use of the RF spectrum for Agency communications links and remote-sensing purposes. Procedures relating to RFI are also presented, and requirements are defined for the support of future NASA programs that may require long-lead-time spectrum management initiatives. Responsibilities of concerned NASA personnel are defined in Chapter 2.

For the purpose of this NPR, the RF spectrum is defined as the set of radio frequencies below 3000 GHz. Also several terms used frequently have very specific, technical connotations for those familiar with the RF spectrum management discipline. A glossary of these terms is provided in Appendix A.

### **1.2 Spectrum Management Policy Guidance**

The U.S. policy, with regard to the use of properly authorized frequency bands, is stated in the Communications Act of 1934, as amended. In order to ensure compliance with the provisions of the Communications Act, OMB Circular No. A-11 (2008), Section 33.4, states that:

Consistent with the Executive Memorandum issued by the President on November 30, 2004, agencies should consider the economic value of radio spectrum used in major telecommunication, broadcast, radar, and similar systems when developing economic and budget justifications for procurement of these systems, starting with the FY 2007 requests. The extent of economic and budget analysis required will depend upon the nature and value of the systems and spectrum involved, and agencies should work with their OMB contacts to ensure a proper level of analysis is conducted.

Spectrum should generally not be considered a free resource, but rather should be considered to have value and be included, to the extent practical, in economic analyses of alternative systems. In some cases greater investments in systems would reduce spectrum needs (e.g., purchase of radios that use less bandwidth than less expensive models); in other cases the desired service can be met with other forms of supply (e.g., private wireless services or use of land lines). In addition to considering cost minimizing strategies, agencies are encouraged to consider whether the investment would provide net benefits.

Spectrum valuations may be estimated based on recent prices of similar bands in spectrum auctions, or

through other estimation methods.<sup>1</sup> The Commerce Department's NTIA, which is responsible for allocating spectrum across Federal users, may also review these analyses in making spectrum assignments.

**Spectrum certification.** You must obtain a certification by the NTIA, Department of Commerce, that the radio frequency required can be made available before you submit estimates for the development or procurement of major radio spectrum-dependent communication-electronics systems (including all systems employing space satellite techniques).

<sup>1</sup> Sensitivity analysis?showing the costs of choosing an alternative that requires less (or more) spectrum?may also provide useful information. For example, a sensitivity analysis might indicate that one option costs \$10 million more, but uses 5 MHz less bandwidth, nationwide, in the 900 MHz range. Even with "conservative" estimated values, the 5 MHz in spectrum savings would likely be worth an additional \$10 million in investment, as it conserves spectrum

The aspect of economic value of radio spectrum is a relatively new requirement being levied on Federal agency programs by Circular A-11, and the specific text is highlighted here to emphasize this new requirement. See sample form for "Economic Value Analysis" in Appendix J.

NASA policies to be adhered to by all Agency spectrum users are given in NASA Policy Directive (NPD) 2570.5D, (see <http://nodis-dms.gsfc.nasa.gov/dms/dms.cfm>).

All RF spectrum usage by NASA programs and projects shall be pursuant to specific assignments approved by the NASA Spectrum Manager, the AA for SOMD, under the conditions specified in this NPR Chapter 3, Section 3.7(c).

### 1.3 Regulatory Structure

Internationally, the RF spectrum is allocated by the International Telecommunication Union (ITU) (see <http://www.itu.int/>) to various classes of service according to different regions of the world (see Figure 1-1). Within the United States and its Possessions, the RF spectrum is further allocated to non-Federal and Federal users. The U.S. national spectrum management activities are conducted by NTIA, the Federal Communications Commission (FCC), and the Department of State. The NTIA manages the spectrum used by Federal Government agencies, the FCC manages the spectrum used by non-Federal entities, and the Department of State is responsible for coordinating United States participation in international fora where spectrum management issues are addressed. The Federal Communications Commission (FCC) is responsible for the allocation and assignment of frequencies to non-Federal users (see <http://www.fcc.gov>). The NTIA is responsible for the allocation and assignment of frequencies to departments and agencies of the U.S. Government (see <http://www.ntia.doc.gov>).

The NTIA performs its functions through the assistance of the Interdepartment Radio Advisory Committee (IRAC) that is also responsible for maintaining the National Table of Frequency Allocations (see Figure 1-2). Coordination between non-Federal and Federal users of the RF spectrum is accomplished through joint meetings of the FCC and the NTIA.

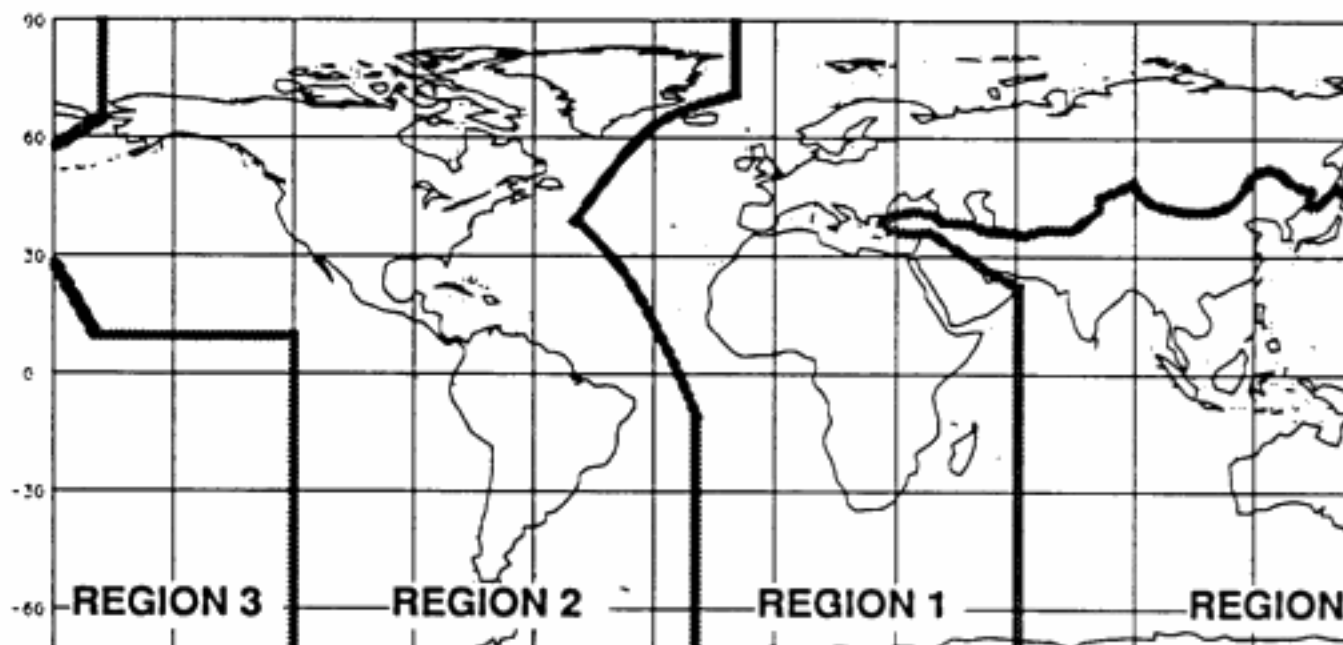


Figure 1-1 Geographic Regions for Frequency Allocation of the Spectrum

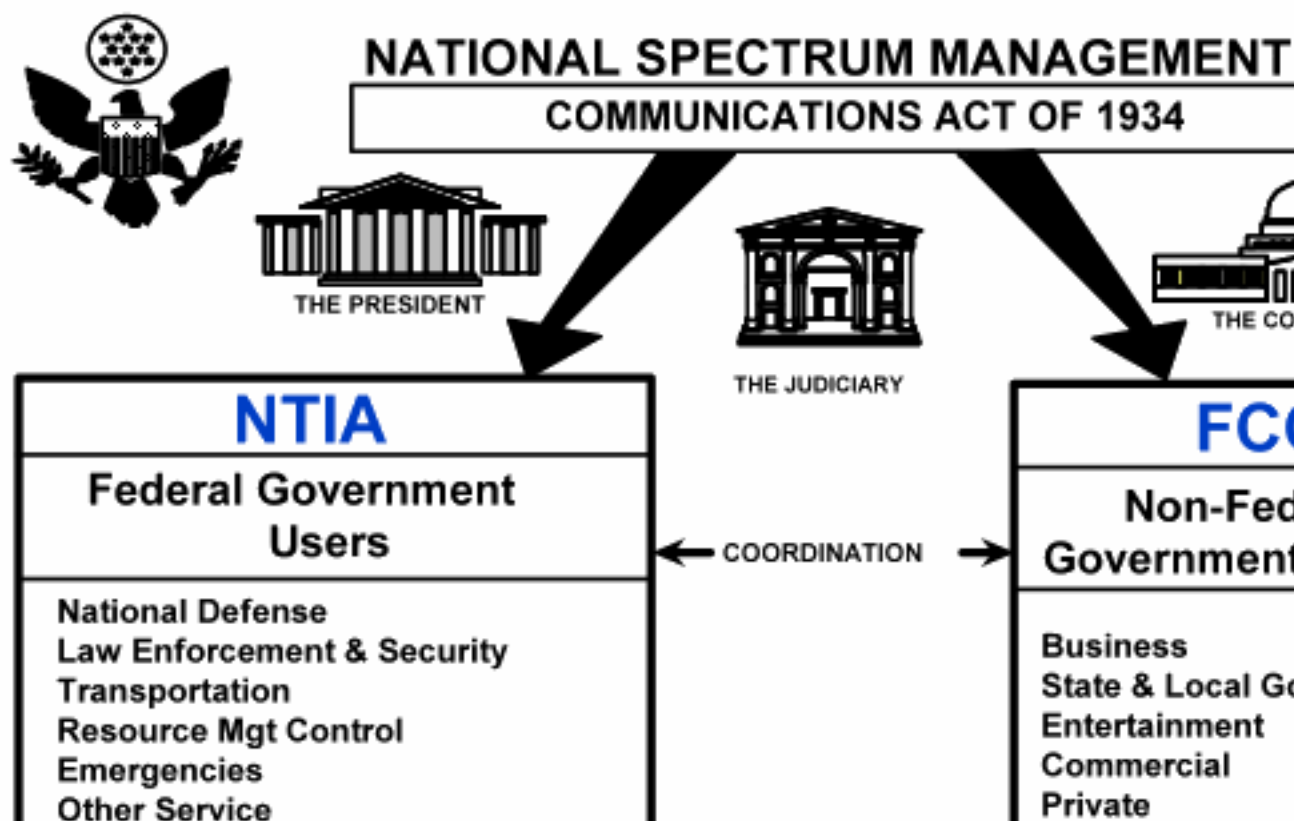


Figure 1-2 United States (US) National Spectrum Management Structure

The 20 Federal agencies are:

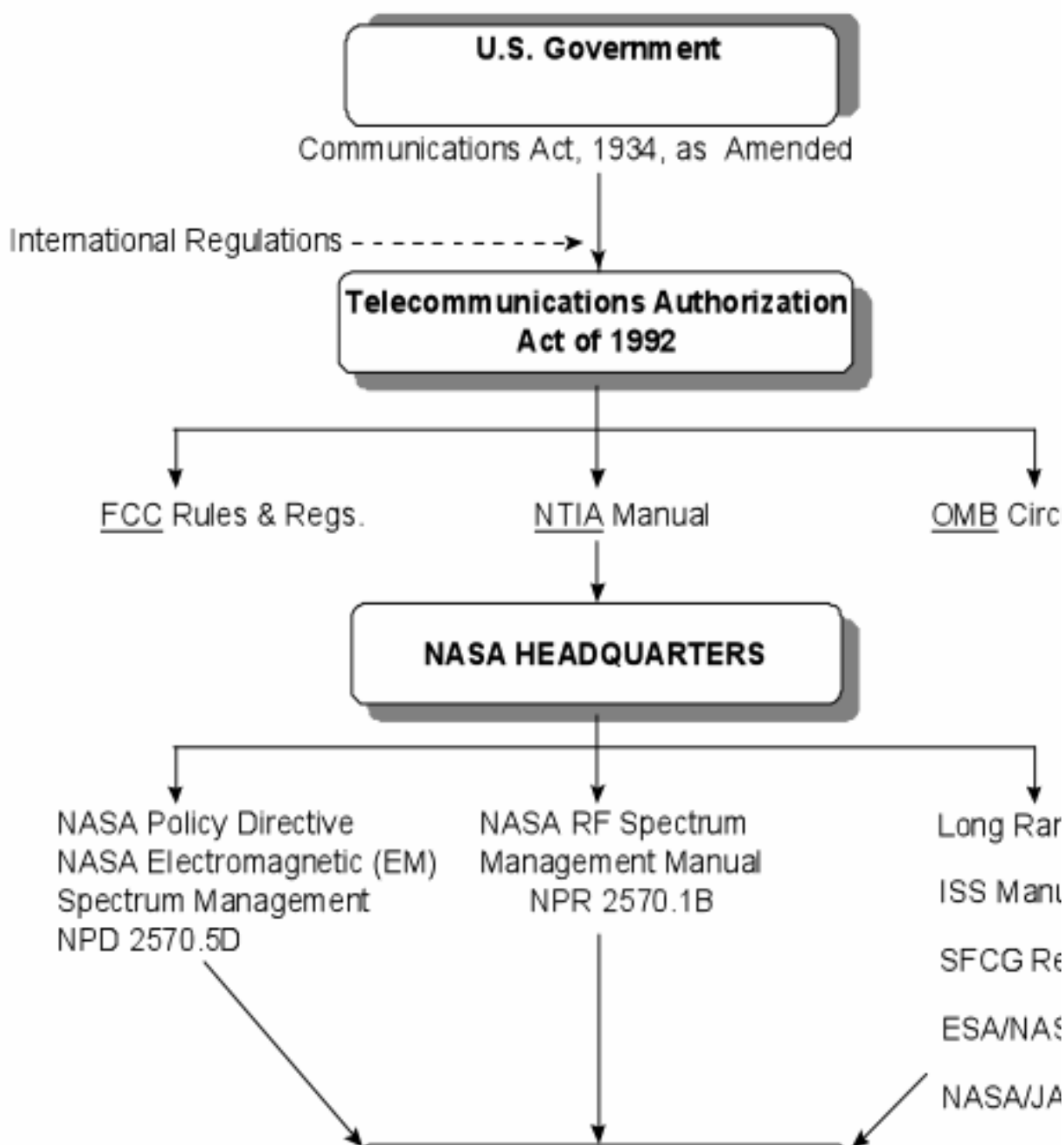
1. Agriculture
2. Air Force
3. Army
4. Broadcasting Board of Governors

5. Coast Guard
6. Commerce
7. Energy
8. Federal Aviation Administration
9. Homeland Security
10. Interior
11. Justice
12. National Aeronautics and Space Administration
13. National Science Foundation
14. Navy
15. State
16. Transportation
17. Treasury
18. U.S. Postal Service
19. Veterans Affairs
20. FCC Liaison

## **1.4 NASA Spectrum Management Program Overview**

NASA responsibility for acquiring frequency allocations and providing assignment of frequencies for NASA programs is delegated to the AA for SOMD. All frequency assignments are made through the AA for SOMD and are issued to NASA RF spectrum users through NASA Center/Facility Spectrum Managers and/or JPL Spectrum Manager (for NASA spectrum management points of contact, see <https://www.spacecomm.nasa.gov/>). Headquarters RF spectrum assignments are obtained through the NASA National Spectrum Program Manager at HQ. Recognizing the global nature of NASA operations and missions, new frequency allocations require international agreement. New frequency allocations are obtained through the NASA International Spectrum Program Manager at HQ in consultation with the National Spectrum Program Manager (note that there is a multiyear lead time required for obtaining new frequency allocations).

The Spectrum Management Program Documentation Tree is shown in Figure 1-3. The tree shows the linkages between NASA spectrum management documentation and U.S. national rules and regulations.



**Figure 1-3 NASA Spectrum Management Program Documentation Tree**

- 1 NASA Long Range Electromagnetic (EM) Forecast  
(<https://www.spacecommunications.nasa.gov/spacecomm/spectrum/default.cfm>)
- 2 SSP 50423, International Space Station Radio Frequency Coordination Manual
- 3 Space Frequency Coordination Group Resolutions and Recommendations  
(<https://www.sfcgonline.org/resources/default.aspx>)
- 4 NASA-ESA Procedures for Coordination of Frequency Use, May 2006
- 5 NASA-JAXA Procedures for Coordination of Frequency Use, May 2006
- 6 International Telecommunication Union Radio Regulations

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